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# Introduction
## Women and Gender in Canadian Science, Engineering and Medicine

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# Women and Gender in Canadian Science, Engineering and Medicine

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This special issue on "Women and Gender in Canadian Science, Engineering and Medicine" is the second one which *Scientia Canadensis* has devoted to this theme. The first was published more than twenty years ago, under the theme of "Women, Technology and Medicine in Canada." The editor wished to call historians' attention to "some hitherto overlooked dimensions of our scientific and technological past." The four articles included in this pioneering volume examined, in the Canadian context, some of the major themes then explored by the primarily American feminist scholarship: the household as an important site of technological activity, women as technological actors, the interaction between new technologies and social beliefs and practices, the impact of technological developments on the family and sexuality, and the impact of culture on the perception and treatment of women by physicians. The articles focused on the late twentieth and early twentieth centuries, a crucial period in women's history more generally. As the editor duly noted, there were no contributions on the large number of Canadian women scientists "whose names have disappeared from history"; there was therefore "great potential" for the study of this forgotten group, with the editor inviting researchers to take up this task.[1]

The aims of this second special issue closely resemble those of *Scientia Canadensis* in 1985: to present recent work covering new topics and new areas of investigation that broaden the scope of the field, to promote new scholarship, and to challenge scholars to incorporate women and gender in the mainstream history of Canadian science, engineering and medicine.

During the intervening decades between these special issues, the historiography of women and gender in Canadian science, engineering and medicine has been enriched by contributions that illustrate an increasing diversity of focuses, approaches, research interests and

1. "Editor's Note," *Scientia Canadensis* 28 (1985): 2.

methodologies. A landmark publication was Marianne Gosztonyi Ainley's interdisciplinary anthology *Despite the Odds: Essays on Canadian Women and Science.* The title could be read in two related ways. It referred to the presence and accomplishments of women in science in nineteenth and twentieth century Canada, despite the struggles they faced to gain access and participate in this male-dominated field which, in the collection, was defined in a broad sense to include medicine, mathematics, social and applied science and technology. But the title also invoked the challenges facing historians interested in retrieving women in science from a largely invisible past and to fully integrate them in the historical record. Ainley explained how Canadian women scientists had been given "short shrift" both from women's history and from the history of science. On the one hand, social history's "bottom's up approach," which most women's historians espoused at the time, had led the latter to a focus on those large groups of "ordinary" women, such as teachers, immigrants and prostitutes, who had been the most ignored by "traditional" history. On the other hand, contrary to the situation in Europe and the United States, the history of science was a new discipline in Canada, and the few historians of science at the time were involved in the daunting task of establishing the field. Ainley also deplored the lack of primary sources, largely due to the fact that the written records of women scientists had not been preserved, even by the women scientists themselves.[2]

The contributions to *Despite the Odds*, including those written from an historical perspective, highlighted several of the main themes that characterized the scholarship on women in science at the time: the access to scientific education in the late nineteenth and early twentieth centuries; the multi-dimensional and gender-specific trajectories of Canadian women in various scientific fields and institutional settings like high schools, universities, museums and government organizations and agencies; the contribution of women "amateurs" in the production and dissemination of scientific knowledge. They also touched upon the themes of exclusion, subordination and marginalization, of gender segregation and lack of recognition, and the conflicts generated by the attempt to combine a scientific career with a family life. Not surprisingly, there were several individual biographies of some well-known women scientists, a necessary first step in the discovery and recovery of women's involvement in the field. The collection could not possibly cover all possible topics; for example, one noticeable gap was the absence of women engineers as subjects of study.

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2. Marianne G. Ainley, ed., *Despite the Odds*: *Essays on Canadian Women and Science* (Montreal: Vehicule Press, 1999), 17-21.

Since its publication, there have been no real successors to *Despite the Odds*. The historical scholarship on Canadian women scientists and engineers, more particularly, has developed relatively slowly since the 1990s.[3] While exciting and groundbreaking work has been conducted, this sub-field has not made the same inroads as other areas within Canadian Women's History and the History of Science and Technology in Canada.[4] Nursing History, which is represented in this special issue, has witnessed a more rapid and integrated growth, while the study of other health care occupations, to which Peter Twohig contributes in this volume, has not attracted enough attention, especially outside of Quebec.[5] Overall, while there are many interconnected issues involved in the study of women in science, engineering and medicine, scholars tend to address them separately, individually and within their own discipline, thus pursuing largely independent research paths that do not cross often enough.

With respect to women and gender in science and engineering, a promising trend is a greater *rapprochement* with women studies scholars from other disciplines and with women scientists and engineers themselves.[6] This broad interdisciplinary collaboration certainly fostered the important strides made by the history of women in science in the United States during the past two decades. This growth can be linked to the development of the large interdisciplinary field of *Feminist Science*

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3. For a discussion on this scholarship, see Ruby Heap, "Writing Them into History: Canadian Women in Science and Engineering since the 1980's," in *Out of the Ivory Tower: Feminist Research For Social Change*, eds. Andrea Martinez and Meryn Stuart (Toronto: Sumach Press, 2003), 49-67. A recent trans-national survey, *Women and Science: Social Impact and Interaction* (New Brunswick: Rutgers University Press, 2006) by Suzanne Le-May Sheffield, from the University of Dalhousie, includes some references on the Canadian context.

4. In the case of Canadian women's history, a telling example is the absence of articles in this field in the various editions of the reader *Rethinking Canada: The Promise of Women's History.* The introduction to the second edition in 1991 did note the "regrettable omission" of contributions focusing more specifically on women's relationships to science and technology. Veronica Strong-Boag and Anita Clair Fellman, eds., *Rethinking Canada: The Promise of Women's History* (Toronto: Copp Clark Pitman, 1991), 5.

5. See Cynthia Toman and Meryn Stuart, "Emerging Scholarship in Nursing History," *Canadian Bulletin of Medical History/Bulletin canadien d'histoire de la médicine* 21, 2 (2004): 223-227; and Peter Twohig, "Recent Writing on Health Care History in Canada," *Scientia Canadensis* 26 (2002): 7-28.

6. See the contribution by Marianne G. Ainley, "Une nouvelle optique concernant la recherche sur l'histoire des femmes canadiennes et les sciences," in the special issue on "Sciences, ingénierie et technologie" published by *Recherches féministes* 15, 1 (2002): 93-111. The guest editor is Claire Deschênes, a professor of engineering at Université Laval and the former NSERC/Alcan Chair for Women in Science and Engineering in Quebec. See also Ruby Heap, "Writing Them into History. Canadian Women in Science and Engineering since the 1980's," in *Out of the Ivory Tower* (see note 3): 49-67.

*Studies,* which aims to illuminate the intersections between science and gender, as well as class, race, ethnicity and sexuality, the relationship between scientific knowledge and scientific practice, and the central role played by science in constructing human differences and inequalities, including those between men and women scientists.[7] Although they remained committed to "righting the record" by searching for the forgotten women in science, feminist historians incorporated in their analyses new insights, concepts and theoretical frameworks emanating from other disciplines. They scrutinized the various structural and ideological mechanisms which shaped and constrained the experiences of women scientists in different disciplines and in specific historical contexts; shifting away from the "women as victims" approach, historians showed at the same time how women scientists were capable of agency by depicting the various strategies they adopted to overcome barriers and pursue a career. Still others focused on the intersections of the private and the public in the lives of women scientists. A key barometer of change was the incorporation of gender in feminist analyses of science, including those produced by historians. "Gender and science" refers to the gender roles of women in society that impact their access to, and participation in science, to the socially defined roles of women in science and to the gendered norms within the culture of science. Feminist historians have been involved in the exploration of all three areas, and have contributed to a critical re-evaluation of science as a gender-neutral domain of activity.[8]

Like their European counterparts, American women historians have also engaged in interdisciplinary conversations with scholars working in Gender and Technology Studies, a field which emerged in reaction to the lack of dialogue between scholars in Women Studies and their colleagues in Science and Technology Studies (STS). Its main concern is to document how the relationship between gender and technology is reciprocal and intertwined, with each socially shaping the other, in different times and in different places. This represents a shift beyond the "women and technology" approach, which focused on women in male-dominated sectors and on women's undervalued activities in order to demonstrate that despite many barriers, women had been active partici-

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7. See Maralee Mayberry, Banu Subramanian and Lisa H. Weasel, "Adventures Across Natures and Cultures," in *Feminist Science Studies*, eds. Maralee Mayberry, Banu Subramanian and Lisa H. Weasel (New York and London: Routledge, 2001), 5-6.

8. For a brief review on the history of women in science and engineering in the United States, see Heap, "Writing Them into History," 53-54. For an excellent discussion on the international literature on Gender and Science, see Delphine Gardey, "La part de l'ombre ou celle des lumières? Les sciences et la recherche au service du genre," *Travail, genre et sociétés* 14 (2005) : 29-47.

pants in the history of technology. The current research now sets it gaze on men as well as women, at femininity and masculinity, and on social and cultural practices. This approach serves to illustrate the role of technologies in the construction of gender, as well as the modern definition of technology as a male pursuit. Scholars have also established that the relationship between gender and technology is not a neutral one, as the association of maleness and technology has served the interests of men. At the same time, historical studies serve to illuminate how this relationship has evolved and changed, since gender and technology are both historically contingent. A historian Ruth Oldenziel puts it, "there is nothing inherently or masculine about technology."[9]

Not surprisingly, engineering constitutes a key subject of inquiry within gender and technology studies. Both individually and collectively, engineers develop and utilize technology in a wide range of institutional contexts. Scholars, including feminist historians, have established that engineering and technology have been culturally associated with masculinity, and that "engineering culture" has shaped and nurtured a specific type of masculinity. To explore how the intersection of masculinity and technology has deployed itself historically, within various educational and professional settings, is key to a better understanding of the continuing under-representation of women in this profession.[10]

As in the case of feminist science studies, gender and technology studies have yet to flourish in Canada as a distinctive interdisciplinary field of inquiry. However, the recent Canadian scholarship clearly reflects the changing and expanding historiographical, theoretical and methodological frameworks developed within these fields, and within other bodies of work, such as the history of the professions and the history of health care providers. New topics and themes are addressed, while enduring ones are redefined and scrutinized in new ways.[11]

Collectively, the essays in this special issue illustrate these trends. They highlight some of the recurrent themes in the history of women in science,

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9. Ruth Oldenziel, *Making Technology Masculine: Men, Women and Modern Machines in America, 1870-1945 (*Amsterdam: Amsterdam University Press, 1999).

10. For recent discussions on the field of gender and technology studies, see Mary Frank Fox, Deborah G. Johnson and Sue V. Rosser, eds., *Women, Gender and Technology* (Urbana: University of Illinois Press, 2006); Jill M. Bystydzienski and Sharon R. Bird, eds., *Women in Academic Science, Technology, Engineering, and Mathematics: Removing Barriers* (Bloomington: Indiana University Press, 2006); Nina E. Lerman, Ruth Oldenziel and Arwen P. Mohun, eds., *Gender and Technology. A Reader* (Baltimore: Johns Hopkins University Press, 2003); Judy Wajcman, *TechnoFeminism* (Cambridge: Polity, 2004); and Wendy Faulkner, "The Power *and* the Pleasure? A Research Agenda for 'Making Gender Stick' to Engineers," *Science, Technology and Gender Values* 25, 1 (2000): 87-119.

11. For a discussion of this recent work, see Heap, "Writing Them into History," 55-61.

engineering and medicine: women's exclusion, marginalization and subordination; the lack of recognition for the work accomplished; the resilience of women and the variety of strategies they developed to persist and challenge the stereotypes about their ability to succeed; the intersection of private and public activities; the relationship between gender and technology and between gender and professionalization, and the impact of external forces such as wars, industrialization and urbanization. The essays are also embedded in the view that science, engineering and medicine can only be understood within the social complexity in which they existed. While still sensitive to the social forces and power relations that worked against women in these domains, the authors unravel women's own agendas, and the motivations, interests and needs underlying them. Women had some power and they exercised those powers, as actors in history. Retrieving the women absent from mainstream history remains a major task, considering the large number of individuals and groups who are still invisible. However, this approach has moved beyond the glorification of the pioneers and of the more well-known "success stories"; rather, the articles are more sensitive to the diversity of women's lives and experiences, in different times and different contexts. As one of our contributors, Alison Prentice, has argued, we need "women's stories as well as men's" if we hope to develop a full picture of how science works and to compare the careers of women in one specialty with those of women studying and working in another.[12] Fundamentally, these combined contributions highlight the importance of considering carefully women's historical, spatial and social locations when trying to reconstitute their experiences in science, engineering and medicine.

This special issue encompasses a large spectrum of women engaged in the fields of science, engineering and medicine in various settings: botanists at the Federal Department of Agriculture, engineering students at the University of Toronto's Faculty of Applied Science and Engineering, women doctoral students and women faculty at the University of Toronto's Department of Physics, a feminist engineer sitting on the Royal Commission on the Status of Women, nurses at the Ottawa Civic hospital, and laboratory and x-ray technicians working in Canadian hospitals. Collectively, the articles cover a period ranging from the late nineteenth century to the end of the last century. The authors examine their subjects both as individuals and as members of a particular group. In

12. Alison Prentice, "Three Women in Physics," in *Challenging Professions: Historical and Contemporary Perspectives*, eds. Elizabeth Smyth, Alison Prentice, Sandra Acker, and Paula Bourne (Toronto: University of Toronto Press, 1999), 119-140.

their quest for evidence, which can be absent or fragmentary, the authors have probed a wide variety of manuscript and printed sources; they have proceeded to a fresh reading and analysis of previously used sources, and skilfully exploited new and often neglected ones. Many authors were able to produce oral histories, and to confront, as a result, these intimate narratives with those contained in other sources.

Canadian universities were sites where "women's work" in science was developing in the late nineteenth and early twentieth centuries. Household science is the best example of the establishment of a feminized field within academic science.[13] But there were also women who were seeking academic employment in male domains. As the article by Alison Prentice demonstrates, the women who obtained doctorate degrees in physics from the University of Toronto were one such group. Using a cross-generational approach, Prentice explores their trajectories as students and as physicists between 1890 and 1990. Her study confirms that the chronology of women in science does not fit neatly with the mainstream historical narrative. Indeed, the 1920s and early 1930s were golden years for women in physics at the University of Toronto, if we consider the relatively large number earning doctorates and securing part- or full-time academic positions. World War II provided wider employment opportunities in universities, but this exceptional period was followed by a major drop which lasted almost three decades, with numbers of women earning doctorates finally picking up once again in the 1960s. The advent of "big science," its increasing appeal to men armed with doctorates, and the increased focus on research after World War II put Canadian women physicists at a disadvantage, much like their American counterparts studied by Margaret Rossiter. Prentice's account is telling of the career patterns of women scientists. Only one of the early generation graduates, Elizabeth Allin, managed to pursue an academic career resembling that of her male colleagues, except that it took her more than twenty years to be promoted from assistant to full professor. The rich oral histories compiled by the author shed new light on the lives and experiences of the more recent generation of women who graduated between 1960 and 1990. Several important themes emerge: the impact of race and ethnicity on women's decision to pursue a career in physics (several respondents born in Europe or in countries like Iran were surprised to see so few women in

13. University-based programs in Household Science fostered the growth of dietetics as a new "woman's profession," while it provided employment to women with graduate degrees in chemistry who were barred from departments of chemistry. See Ruby Heap, "From the Science of Housekeeping to the Science of Nutrition: Pioneers in Canadian Nutrition and Dietetics at the University of Toronto's Faculty of Household Science, 1900-1950," in *Challenging Professions* (see note 12), 141-170.

physics in Canada); the critical role of marriage, either as a means to combat isolation and secure emotional support, or as an impediment to career advancement; and the tension between family commitments and career goals, which clearly stands out as the major problem faced by this generation.

For their part, Ruby Heap and Crystal Sissons focus on the largely unexplored history of Canadian women engineers. Heap examines the fundamental issue of access to engineering education in her case study of the first generation of female engineering students at the University of Toronto during the 1920s and 1930s. Contrary to a commonly held belief, Canadian women sought and obtained an engineering education long before the 1960s and 1970s. Comparisons with the United States and European countries suggest, in fact, that the early twentieth century was a critical period with respect to the admission of women in engineering schools.[14] Access to the student records of the Faculty of Applied Science and Engineering (FASE) allowed the author to draw the demographic and academic profile of the handful of women who enrolled at FASE at the time. They were young, urban and skilled, and they could rely on their family's material and emotional support. While female engineering students shared with their male counterparts a similar social background and similar academic and professional goals, gender also shaped engineering education at FASE. The article documents how the masculinity-technology equation fed the "School Spirit" at FASE both inside and outside of the classroom. While it was not homogeneous, FASE's masculine culture dissociated engineering from women and femininity. Whatever strategies they adopted to "blend in," female students inevitably stood out because of their gender. At the same time, Heap's discussion shows how this first generation found a niche in the new specialty of chemical engineering, a field considered more acceptable to women. The extant evidence suggests that these pioneers responded in different ways to their environment. Furthermore, the barriers and setbacks, both personal and professional, that many encountered once they entered the work force lead us to consider that finding employment as a female engineer was an even more formidable challenge. Fruitful comparisons can be made with the female graduate students in physics examined by Alison Prentice, with respect, for example, to their early love of math and science, their relationship with their male peers ("to be one of the boys" sums it up), and their optimism when entering the job market.

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14. See the contributions in Annie Canel, Ruth Oldenziel and Karin Zachmann, eds., *Crossing Boundaries, Building Bridges: Comparing The History of Women Engineers, 1870s-1990s* (Amsterdam: Harwood Academic Publishers, 2001).

The study of their experiences combined is telling of the dilemma often faced by women in western societies aspiring to pursue a career in male-dominated fields: on the one hand, they were compelled to be like men if they wanted to succeed, while, on the other hand, they were expected to perform the female roles which were ascribed to them.

Elsie Gregory McGill, one of the pioneers enrolled at FASE in the early twentieth century and one the most "famous" women in Canadian engineering, is the subject of Crystal Sissons' article. While she stands as an icon for Canadian women engineers, scholars have only partially examined McGill's life and accomplishments. One major chapter of her life which has been overlooked by women's historians as well as by historians of engineering is the critical role she played as a member of the Royal Commission on the Status of Women, which produced a groundbreaking report in 1970. Asking new questions to the massive amount of material produced by the Royal Commission enabled Sissons to explore McGill's important legacy from two angles: she discusses how her training and professional experience as an engineer impacted on her work as a commissioner; at the same time, Sissons leaves no doubt as to McGill's feminism. Like American engineer Nora Stanton Blatch, McGill was indeed a third generation feminist within her family; as Sissons argues, a discussion of McGill's brand of feminism sheds new light on the Canadian women's movement in the 1950s and 1960s. It also addresses a key question raised with respect to women engineers: what has been their relationship to feminism? While most women engineers seem to have stayed away from feminism, Sissons' article serves as a caution against hasty generalizations; it calls for more research on the views and actions of women engineers, and for a rethinking of what constitutes feminism.

While young women were breaking new ground by opting to pursue a university education in physics and engineering in the early twentieth century, others were seeking scientific employment at various locations. What options were open to them? Amber Lloydlangston addresses this crucial question by looking at the women who worked in botany at the Federal Department of Agriculture between 1887 and 1921. The author shows how the professionalization and bureaucratization of science and of the federal civil service transformed the kind of workwomen performed at the Department of Agriculture. She highlights the contributions of women "amateur" botanists like Catherine Parr Trail to the scientific activities conducted by the Dominion Entomologist and Botanist, following his appointment by the Department of Agriculture in 1887; their services, however, were no longer required once scientific work and the civil service professionalized and bureaucratized at the turn of the century. Rather, a large pool of available women with a high school education

were hired as "seed analysts." This new type of employment was immediately classified as "women's work," since it supposedly required women's "specific skills"; for those holding this job, this meant, of course, routine work, low status, low pay, no advancement, and supervision by male university graduates. However, more educated and qualified women were also excluded from "men's work" in the Department of Agriculture. Faith Fyles, a McGill University graduate who had studied with Carrie Derick, is a case in point. Although she was appointed as an "Assistant Botanist," a position which could have been awarded to a man, Fyles performed volunteer work, assisted male scientists, suffered a demotion and a pay cut, and spent twenty years in a job that did not lead to a higher level position or to any other kind of recognition. Lloydlangston's detailed account provides a useful comparative lens through which we can observe the construction of territorial and hierarchical patterns of gender segregation in government science, in Canada, the United States and elsewhere.

Peter Twohig and Cynthia Toman shift our focus to health care providers in hospital settings during the twentieth century. Twohig discusses the development of x-ray and laboratory technicians, two groups who emerged in the early twentieth century and joined physicians and nurses in the provision of health care. X-ray and laboratory technicians can be considered as "technical workers," since they use manual and technical tasks and are not involved in the intellectual work of interpreting the results. The article depicts the two opposing forces at play with respect to the growth of these occupational groups between 1920 and 1960. On the one hand, there were efforts to regulate and professionalize x-ray and lab technicians through the creation of national associations, of accredited training programs and of a national practice registry. The goal to create a professional identity through the formal recognition of a clearly defined scope of practice was offset, however, by the limited training offered in Canadian hospitals, by the staffing problems of small and rural hospitals, and by the overall increased demand for hospital workers; as a result, multi-tasking was expected of many x-ray and laboratory technicians, as it was from other hospital workers, including nurses who were already performing multiple duties. Twohig dispels the assumption, entertained by many studies of health care professionals, that health care workers in the "modern hospital" were highly specialized and only performed a single role. Rather, he describes health care work as a "contested geography," with many working across disciplines and employers demanding broad and flexible skills. His article calls for more foundational studies on the division of labour within health care, in particular contexts, so historians can re-examine the notions of "expertise" and of "occupational identity."

As Twohig reminds us, women formed the vast majority of these groups of multi-tasking hospital workers. He argues that their engagement with technology in the diagnostic services, rather than providing an impetus to professional claims, served instead to "blur their roles," while confirming their subordination to physicians. Cynthia Toman's article on the delegation of medical technology to nurses at the Ottawa Civic Hospital between 1947 and 1972 provides another perspective on the impact of technology on the status of rank-and-file practitioners. Like Twohig, Toman draws a complex picture of hospital work and of nursing practice. During the period under study, Ontario nurses experienced substantial changes in their practice related to the increased rate of delegation of technological roles and responsibilities by physicians. However, the transfer of "delegated medical acts" (DMA) was not a smooth and flowing process; nurses contested the delegation of some acts, while they took advantage of other DMA to negotiate new occupational spaces for themselves. Toman argues that delegation both fostered and constrained the development of nursing practices. It ended up creating a new hierarchy between "general duty nurses" and the "specialty nurses" who had acquired technological competence. Furthermore, it exacerbated ideological differences between the rank-and-file nurses, who valued the acquisition of technological knowledge and skills, and their leaders who argued that professional advancement required a move into education, administration or supervisory work. These developments did not compromise the highly gendered relationships that prevailed in hospitals, which Twohig reports in his article. Physicians only delegated the less desirable, routinized or bothersome dimensions of the technology to nurses, thus keeping apart the *science* (knowledge work) and the *art* (skills and techniques) components of medical technologies. Toman's contribution reflects current Canadian nursing historiography, which seeks to reveal complexity and diversity within the profession, and to depict the continuing practice shifts and the ongoing negotiations among practitioners.[15] As the author argues, it also serves as a telling reminder that the "absence of ordinary women from histories of science and technology may be partially explained by *what* has been excluded as science, as well as *who* have been excluded as women of science."

The essays in this volume obviously cover only a few of the multiple areas of historical investigation related to the women and gender in science, engineering and medicine. Many gaps remain, and a wide range of themes and issues await further study. I will submit just a few. The critical transition from professional training to professional practice needs

15. Toman and Stuart, "Emerging Scholarship in Nursing History," 224.

to be scrutinized from the perspective of women graduates. The various specialties and sub-disciplines within science, engineering and medicine should be examined more closely in particular times and places, both as social institutions and as systems of knowledge with their specific sets of values, culture and practices. For their part, scholars working in gender and technology studies invite us to produce detailed analyses on the construction of rituals and models of masculinities in science, engineering and medicine, and on how these identities changed over time. For example, further investigations will provide a better understanding of how the expansion of science and of the culture of research in Canada after World War II led to the construction of the dominant male model of the ideal scientific career, which Margaret A. M. Murray, in her study of women in the American mathematical profession, has defined as the myth of the mathematical life course.[16] At the same time, we should follow Marianne Ainley's important lead and look at women's careers through a "different lens" by asking how they defined "career" and "success" for themselves, rather than comparing only their trajectories with those of their male counterparts.[17]

Other topics to be considered are the role of women as teachers, mentors, supervisors and employers of other women in these fields, and the token status that many had to bear. The relationship between women in science, engineering and medicine, and the women's movement in Canada since the middle of the nineteenth century has yet to be fully investigated. Finally, the diverse and complicated lives of women in these fields cannot be fully understood without a close examination of the interplay between gender and class, race, ethnicity, religion and sexuality.

On January 14, 2005, then-Harvard President Lawrence H. Summers ignited a wave national and international protest and debate. In a conference delivered at the National Bureau of Economic Research on Cambridge, Massachusetts, on diversity in science and engineering, he suggested a that sex differences in cognitive ability were more determining factors in explaining the under-representation of women in these fields than social, structural and cultural factors such as discriminatory practices, socialization processes, sex-stereotyping and family/work conflicts. Indeed, the reaction to President Summers' remarks was widespread; the media grabbed the story and gave it ample coverage; women in science and engineering advocates and leading female scientists publicly condemned his views; Harvard University set up a Task Force on

16. Margaret A. M. Murray, *Women becoming Mathematicians* (Cambridge, Massachusetts: MIT Press, 2000), xi.
17. Ainley, "Une nouvelle optique," 102-108.

Women in Science and Engineering, and several conferences were organized to explore the issue. What is now referred to as the "Summers Affair" is triggering new interdisciplinary research into the persisting issue of the unequal participation of women and men in the natural and physical sciences.[18] Historians, including Canadian historians, have a key role to play in this renewed quest for answers to this complex problem. It is my hope that this special issue will foster such research, as well as other compilations of current and future work on Women and Gender in Canadian Science, Engineering and Medicine. This will help build the foundation upon which this field full of promise can witness further and more rapid growth.

I would like to thank all the authors for their contributions, their availability and their commitment to the expansion of the field. My special gratitude goes to the editor of *Scientia Canadensis*, Stéphane Castonguay, for his continuing support, welcomed insights and enduring patience. This special issue would not have seen the day without him.

18. For example, see the National Academy of Sciences, National Academy of Engineering and Institute Medicine, *Biological, Social and Organizational Components of Success for Women in Academic Science and Engineering: Report of a Workshop* (Washington, D.C.: National Academies Press, 2006), and Stephen J. Ceci and Wendy M.Williams, eds., *Why Aren't More Women in Science? Top Researchers Debate the Evidence* (Washington, D.C.: American Psychological Association, 2007).